MICRO-EPSILON

More Precision

thermoMETER // Non-contact infrared temperature sensors

thermoMETER CTRatioM1/M2

Glass fiber ratio pyrometer provides extremely short response time with metal objects

- Measuring range from 250 °C to 3000 °C
- Extremely short response times from 1 ms
- Resistant to disturbances such as smoke, fog and partially concealed or moving objects
- Measurement depends only on the emissivity ratio but not on the absolute emissivity
- The measurement object can be smaller than the measurement spot
- Up to 200 °C ambient temperature without cooling
- High optical resolution with selectable focal point
- Integrated sighting laser marks spot size
- Programmable 1- or 2-channel mode
- Separate controller with programming keys and backlit display

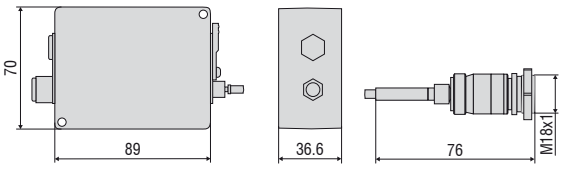
Optical parameters thermoMETER CTRatioM1/M2

Standard Focus									
SF38 lens	38:1	7.9	13.2	19.7	26.3	39.5	52.6	65.8	131.6
SF50 lens	50:1	6	10	15	20	30	40	50	100
SF100 lens	100:1	3	5	7.5	10	15	20	25	50
	distance in mm	300	500	750	1000	1500	2000	2500	5000

Note: The measuring spot size refers to 90 % of the radiation energy.
The distance is measured from the front edge of the sensor head.

Model		CTRM-1LSF38-C3	CTRM-1HSF100-C3	CTRM-1H1SF100-C3	CTRM-2LSF38-C3	CTRM-2HSF50-C3	CTRM-2H1SF100-C3
Optical resolution (90 % energy)		38:1	100:1		38:1	50:1	100:1
Temperature ranges	1-channel	450 to 1400 °C	650 to 2000 °C	900 to 3000 °C	250 to 1000 °C	375 to 1500 °C	500 to 3000 °C
	2-channel	525 to 1400 °C	700 to 2000 °C	1000 to 3000 °C	275 to 1000 °C	400 to 1500 °C	550 to 3000 °C
Spectral range		0.8 to 1.1 µm			1.45 to 1.75 µm		
Variable focus		300 mm to infinity, continuously adjustable					
System accuracy [2), 4)]		±(0.5 % $T_{of\ reading}$ +2 °C)					
Repeatability [2), 4)]		±0.3 % of reading					
Temperature resolution (> 900 °C)		0.1 °C					
Response time (95 % signal) [3)]		1 ms - 10 s					
Emissivity ratio [5)]		0.800 - 1.200					
Emissivity [5)]		0.050 - 1.000					
Signal processing [5)]		1-channel / 2-channel mode; alarm monitoring; peak hold, valley hold, average; extended hold function with threshold and hysteresis					
Software/App		thermoMETER Ratio Connect					
Outputs/analog		2x 0/4-20 mA (12 bit)					
Outputs/analog	optional	2x 0/4-20 mA (16 bit) isolated					
Relay interface	optional	relays: 2 x 60 VDC/42 VAC_{eff}; 0.4 A; electrically isolated					
Digital interface		USB (Micro-USB, USB-C, USB-A cables included)					
Digital interface	optional	RS232, RS485					
Output impedances		max. 500 Ω (with 8-30 VDC)					
Inputs/outputs digital		three programmable in-/ outputs, usable as: alarm output (open collector 24 V/1 A), digital input for triggered signal output & peak hold function or as analog input for external emissivity or slope settings.					
Length of fiber-optic cable		3 m (standard), 8 m, 15 m					
Power supply		8 - 30 VDC or USB [1)]					
Power consumption		max. 5 W					
Sighting laser		laser 520 nm, <1 mW, ON/OFF via electronic box or software					
Protection class		IP65 (NEMA-4)					
Ambient temperature		sensor: -20 °C to 200 °C (optional up to 315 °C); controller: 0 °C to 50 °C					
Storage temperature		sensor: -40 °C to 200 °C; controller: -40 °C to 85 °C					
Relative humidity		10 to 95 %, non-condensing					
Vibration [3)]	sensor	IEC 60068-2-6 (sinus-shaped), IEC 60068-2-64 (broadband noise)					
Shock [3)]	sensor	IEC 60068-2-27 (25 g and 50 g)					
Housing (size) [3)]		36.6 mm x 70 mm x 95.5 mm					
Weight		sensor with fiber-optic cable: 210 g; controller: 420 g					

[1)] USB powered device works only in digital communication mode
[2)] ε = 1, response time 1 s; no signal attenuation / Specification valid for 5 - 95 % of measuring range
[3)] With dynamic adaptation to low signal levels
[4)] with ambient temperature of 23 ±5 °C
[5)] adjustable via programming keys or software/app

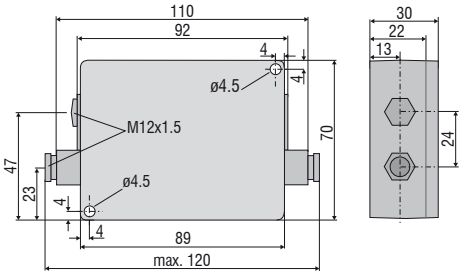


Product identification

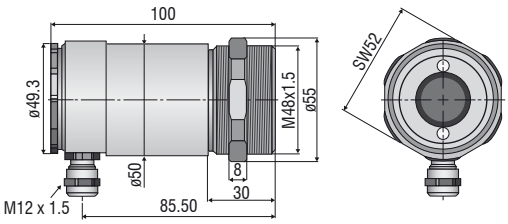
CTRM -	1	L	SF38-	C3
				Cable length [3 m (standard) / 8 m / 15 m]
			Focus [SF38 / SF50 /SF100]	
		Temperature range [L / H/ H1]		
	Spectral range [1=0.8 to 1.1 µm / 2=1.45 to 1.75 µm]			
thermoMETER CTRatioM				

CTLaser / CTLaserFAST / CTLaserGLASS / CTLaserM1/M2/M3/M5 / CTLaserCOMBUSTION

Controller

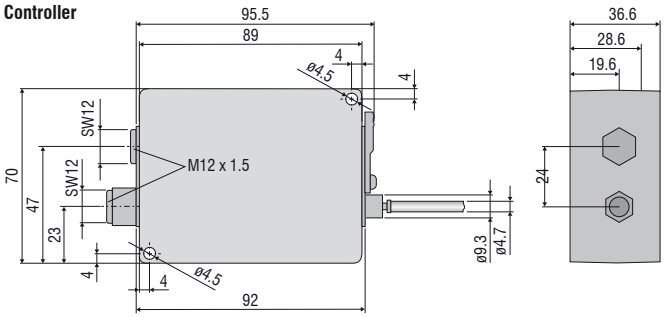


Sensor

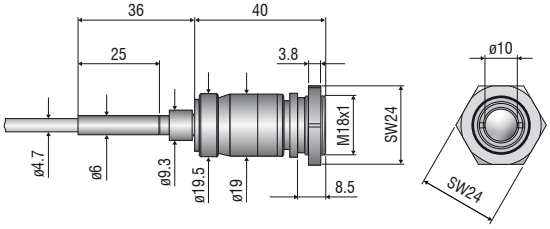


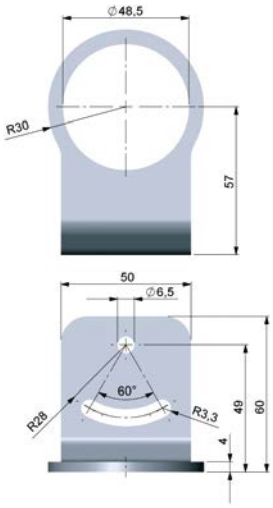
CTRatioM1/M2

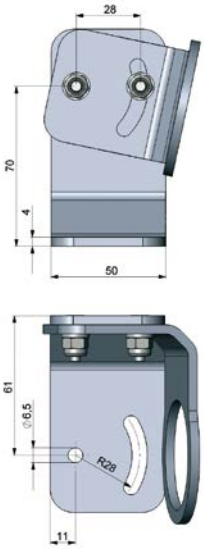
Controller



Sensor



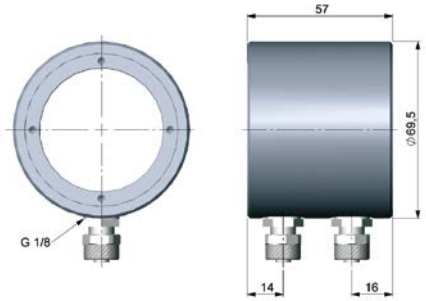




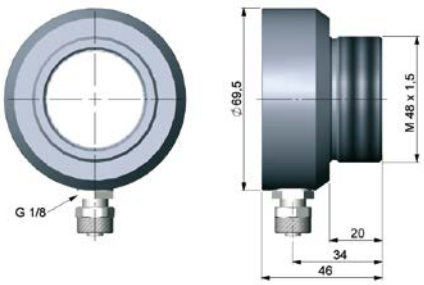
TM-FB-CTL Mounting bracket (fixed);
included in CTL scope of supply

TM-AB-CTL Mounting bracket (adjustable)

TM-W-CTL Water cooled housing and
air purge collar TM-AP-CTL,
mounted on adjustable mounting bracket TM-AB-CTL



TM-W-CTL Water cooled housing



TM-AP-CTL Air purge collar

Mechanical accessories		
Art. No.	Model	
2970238	TM-AB-CTL	Mounting bracket, adjustable, stainless steel
2970239	TM-AP-CTL	Air purge collar, stainless steel
2970240	TM-W-CTL	Water cooled housing, stainless steel, for ambient temperatures up to 175 °C
2970241	TM-RAIL-CTL	Rail mount adapter for CTLaser controller
2970242	TM-COV-CTL	Closed cover for controller
2970243	TM-MN-CTL	Mounting nut, stainless steel (spare)
2970244	TM-FB-CTL	Mounting bracket, fixed, stainless steel (spare)
2970298	TM-A20UN-CTL	Screw adapter M48x1.5 on 20UN-2A screw including mounting nut

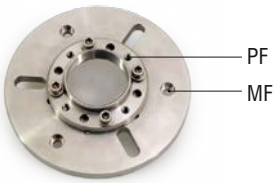
High temperature accessories		
2970366	TM-J-CTL	Cooling jacket (length 228 mm, ø89 mm) (conversion kit TM-CONK-CTL is required)
2970374	TM-CONK-CTL	Conversion kit for CTL on axial cable exit, for integration in cooling jacket
2970368	TM-JAB-CTL	Adjustable mounting bracket for cooling jacket
2970369	TM-MF-CTL	Mounting flange M48x1.5 for TM-PF-CTL
2970370	TM-AST300-CTL	Reflection protection tube M48x1.5, 300 mm length
2970371	TM-PA-CTL	Pipe adapter M48x1.5
2970372	TM-RM-CTL	Furnace wall mount accessory for CTL (TM-MF-CTL, TM-AST300-CTL and TM-PA-CTL)
2970412	TM-PF-CTL	Pipe flange M48x1.5 for directly mounting a CTL sensor
2970487	TM-CJA-CTL	Cooling Jacket Advanced - universal cooling jacket for CSLaser, CTLaser and CTVideo / CSVideo up to 315 °C

Calibration		
2970253	TM-CERT-CTL	Certificate of calibration
2970324	TM-HTCERT-CTL	Certificate of calibration for CTLaser M1-/M2-/M3-/M5-/G-sensors

Interfaces		
2970245	TM-USBK-CTL	USB interface, computer cable, CompactConnect software second cable gland for controller
2970246	TM-RS232K-CTL	RS232 interface, computer cable, CompactConnect software, second cable gland for controller
2970338	TM-RS485USBK-CTL	RS485-USB-adapter, incl. PC cable, CompactConnect software and CTmulti, second cable gland for use with interface board TM-RS485B-CTL
2970248	TM-RS485B-CTL	RS485 interface board incl. second cable gland
2970249	TM-CANK-CTL	CAN-Bus interface; protocol: CANopen Presets: module address20 (14H), 250 kBaud, 0-60 °C
2970250	TM-PFBDPK-CTL	Profibus-DPv1 interface with plug-in connection
2970251	TM-ETHNK-CTL	Ethernet-Kit: interface board, external Ethernet adapter, CompactConnect software, second cable gland
2970252	TM-RI-CTL	Relay interface: two electrically isolated relays, 60 VDC/ 42 VAC_{eff}, 0.4 A

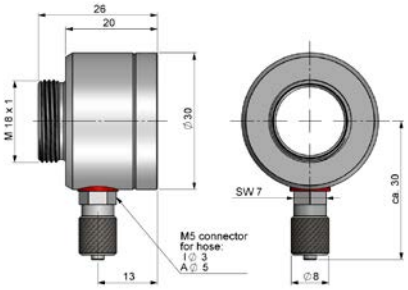
Sensor cables and high temperature cables for CTLaser		
2970374	TM-CONK-CTL	Connector-Kit for cables with connector
4800254.003	TM-CB3C-CTL	Sensor cable with connector (3 m)
4800254.003H	TM-CB3HC-CTL	High-temperature sensor cable (up to 180 °C) with connector (3 m)
4800254.008	TM-CB8C-CTL	Sensor cable with connector (8 m)
4800254.008H	TM-CB8HC-CTL	High-temperature sensor cable (up to 180 °C) with connector (8 m)
4800254.015	TM-CB15C-CTL	Sensor cable with connector (15 m)
4800254.015H	TM-CB15HC-CTL	High-temperature sensor cable (up to 180 °C) with connector (15 m)

TM-J-CTL Cooling jacket (length 228 mm, ø 89 mm) with adjustable mounting bracket TM-JAB-CTL; suitable for ambient temperatures up to 180°C



TM-PF-CTL and TM-MF-CTL mounting flange M48x1.5 for directly mounting a CTL sensor

TM-RM-CTL Furnace wall mount accessory for CTLaser / CTratio: TM-MF-CTL, TM-PF-CTL, TM-AST300-CTL and TM-PA-CTL



TM-AP-CTR Air purge collar

CTRatio		
Art. No.	Model	
2970348	TM-FB-CTR	Mounting bracket, stainless steel, adjustable in one axis
2970395	TM-AP-CTR	Air purge collar, stainless steel
2970373	TM-RM-CTR	Furnace wall mount
2970351	TM-CERT-CTR	Certificate of calibration

Further IR temperature measurement devices from Micro-Epsilon

thermoIMAGER TIM
Compact USB thermal imaging cameras for precise thermography

thermoMETER CTVideo/CSVideo
Infrared temperature sensors with crosshair laser sighting and video output

thermoMETER Handheld
Innovative handheld pyrometer with laser sighting for inspection and maintenance

Modifications reserved / Y9766229-E032070SGO

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